

# Understanding the Role of Leverage in the Outcome of a Nuclear Weapons Program

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## ABSTRACT

Why were some countries able to succeed in acquiring nuclear weapons while others didn't when facing international pressure to stop the development of their nuclear program? I hypothesized that the level of leverage placed over the country trying to acquire nuclear weapons by its main ally and adversary is a key variable affecting the outcome of that country's nuclear program. To test my hypothesis, I first described the different categories of leverage and I then compared the nuclear programs of North Korea and Taiwan using existing historical research and case studies. I compared the two countries to see if the categories of leverage were in fact different for the two countries. The two countries were chosen since they had different results (Taiwan failed, while the DPRK succeeded) and both had an ally and adversary that had some leverage over it. If leverage was different for the two countries it would be highly likely that leverage had a role in causing the different outcomes, thus supporting my hypothesis. If leverage was the same for the two countries, it would mean that leverage was not a factor causing the different outcomes and my hypothesis would be incorrect. After comparing the nuclear programs of the two countries it was found that leverage was in fact different for the two countries, thus supporting my hypothesis.

## Introduction

Nuclear weapons present a grave threat to the safety of our world. The use of nuclear weapons accompanies a massive loss of lives. This was seen in August of 1945 when the United States dropped the first atomic bomb on the city of Hiroshima and the second on Nagasaki. The blasts immediately caused 80,000 and 40,000 deaths respectively and additional tens of thousands of people died in the aftermath through the radiation that was released (History.com Editors, 2020). The use of nuclear weapons and the damage of nuclear war would not only have devastating impacts on the areas bombed but also the entire world due to the nuclear winter that would follow a nuclear conflict. Nuclear winter is when smoke and dust from nuclear blasts travels up into the atmosphere and blocks sunlight from the surface, causing a global temperature drop of about 10°C or 50°F (Derouin, 2019). This temperature drop would cause crops to die and create food shortages placing approximately 2 billion people at risk of starvation (Helfand, 2015).

Thankfully in the late 1960s, countries began to recognize the threats that nuclear weapons posed and started efforts to prevent the spread of nuclear weapons. One example of such an effort was when multiple countries came together at the UN to create the Treaty on the Non-Proliferation of Nuclear Weapons (N.P.T.), which went into force in 1970 to prevent the spread of nuclear weapons and promote the peaceful use of nuclear energy. It currently has 191 signatories and is considered to be one of the most important agreements and forms the basis for international non-proliferation efforts (efforts to prevent the spread of nuclear weapons) today. After the N.P.T. went into force, countries with suspected nuclear weapons programs were met with international opprobrium and pressure to disarm. While the international pressure was successful in preventing many countries from getting nuclear weapons, some countries such as India, Pakistan, Israel, and North Korea were able to succeed in their nuclear ambitions. The question of why some countries succeeded while others failed when facing international pressure to stop developing nuclear programs

is important since lessons learned from failed non-proliferation efforts can be used to prevent future nuclear proliferation(spread).

## Review of Literature

To answer the question of why some countries succeeded and others failed in their nuclear ambitions, Monteiro and Debs explore the relationship between the country trying to acquire nuclear weapons (CANW), its major ally, and its major adversary (Monteiro & Debs, 2014). They argue that in order to have the willingness to develop nuclear weapons a country must be facing a significant threat from an adversary that is not covered by the defense of its allies (if available). From this, it can be inferred that an ally extending security assurances to a CANW can take away the willingness. To answer the second question of why only a few of the motivated countries succeeded, they argue that along with the desire, a country must also have the opportunity to successfully acquire a nuclear capability. The opportunity comes when the CANW has enough strength of its own or the protection of an ally to defend against a preventive strike by an adversary. A preemptive strike is a military attack on a CANW to destroy that country's nuclear facilities. A preemptive strike can range from a single airstrike on a nuclear facility to the complete invasion of the CANW. The adversary has the incentive to use a preventive strike to protect itself against a potential threat. While Monteiro and Debs focus mainly on the ability to launch or deter a preemptive strike, there are other ways the ally and adversary can alter the outcome of a nuclear program, such as the use of leverage to prevent proliferation which is what this paper explores.

## Methods

This paper tries to determine if leverage used by the ally and adversary of the country trying to acquire nuclear weapons is a key variable affecting the outcome of a nuclear weapons program; this is done by comparing the nuclear weapons programs of North Korea (DPRK) and Taiwan (ROC) by using existing historical research and case studies. The rationale behind the selection of the two countries is that they had different results (Taiwan failed, while the DPRK succeeded) and both had an ally and an adversary with amounts of economic and military leverage over them. The paper shall consider only the leverage placed by the single most influential ally and adversary of the two respective countries. In this paper, the ally is determined to be a country that has the most military cooperation and economic activity (bilateral trade, aid, foreign investment, etc.) with the country that is trying to acquire nuclear weapons. An adversary is determined to be the country that poses the security threat that is the source of motivation behind the development of nuclear weapons by the country being examined. In Taiwan's case, the ally is the U.S. and the adversary is China. For the DPRK, the ally is China and the adversary is the US. South Korea is not considered the main adversary of the DPRK since it did not have nuclear weapons, the US having nuclear weapons caused it to pose a greater threat to North Korea, thus making it the main adversary.

The variations of leverage for the ally and the adversary are the following:

High ally leverage is when the ally is a major source of trade and has a military assurance that provides a key source of deterrence against the major adversary for the country trying to acquire nuclear weapons (CANW). The ally must also be able to sanction trade and take away its military assurances without having major negative implications for its own national security or economy. Major negative implications would include anything that has an impact on the day-to-day lives of the citizens of the ally. This includes economic depression, internal security risks, war, etc.

Low ally leverage is when the ally is not a major source of trade and military assurance for the CANW; or if the ally is a major source of trade and military assurance, but is not able to sanction trade and take away its military assurances without having major negative implications for its own national security or economy.

High adversary leverage is when the adversary can credibly threaten preemptive strikes that would have devastating impacts on the in order to coerce the CANW to give up its nuclear weapons program. To have credibility, the adversary must be significantly stronger militarily compared to the CANW so that the adversary is in a situation where the casualties of preemptive strikes are not significant to itself or its allies. Significance is determined to be above 10,000 military and 1,000 civilian casualties. The value for civilian deaths is set at 1,000 to ensure that the deaths are not due to rare situations. Military casualties are set at 10,000 since neither the 6 Day War nor the US-Iraq War, both of which are considered to be preemptive attacks, had more than that many casualties (Strauss, 2017; History.com Editors, 2018; U.S. Department of Defense, 2021). Another indication of high leverage is if the adversary can reduce the threat it poses to the CANW in order to take away the motivation to develop nuclear weapons. In the latter form of high leverage, the adversary must be in a position where the consequences of the PF succeeding exceed the consequences of relaxing its military pressure on the CANW. To use the last form of leverage, the adversary must have credibility so that the CANW is confident that the adversary will carry out its promises to reduce its military threat. Credibility is established by the adversary by fulfilling its promises to reduce its military threat and any other promises it makes during the negotiations.

Low adversary leverage is when the adversary cannot credibly threaten preemptive strikes. Another indication of low leverage is if the adversary cannot reduce the military threat it poses to the CANW, this occurs when the consequences of relaxing its military pressure on the CANW exceed the consequences of the CANW succeeding to the adversary. Low leverage could also be when the adversary doesn't establish credibility with its promises. This happens if the adversary goes back on its pledge to reduce its military threat or doesn't deliver on the promises it makes.

After examination, if it is found that the two countries had varying amounts of leverage placed over them by their respective ally and adversary it can be inferred that leverage placed a role in the different outcomes of the nuclear programs and thus my hypothesis would be proved true. If both countries had similar levels of leverage placed over them, it is inferable that leverage was not a key variable affecting the outcome of the nuclear programs and my hypothesis would be false.

## Introduction to the Two Program

### *Taiwan/ Republic of China (ROC)*

The Chinese civil war was fought over control of China between the Communists and the Nationalists from 1927 to 1949. In 1949, as the Communists were gaining more power the Nationalists were forced to evacuate to the island of Taiwan. Taiwan then became the Republic of China (ROC) while the communists declared that mainland China was the People's Republic of China (PRC). Neither side was satisfied with the result of the war, the Nationalists didn't accept defeat and planned to retake the mainland, while the Communists were determined to conquer Taiwan, leading to high amounts of tension between the two sides. In response to the tension, the U.S. and Taiwan signed a Mutual Defense pact in 1954. The U.S. supported Taiwan since it viewed the country as an ally in the fight against communism. However, the pact wasn't enough to satisfy the Nationalists' ambitions to attack and reclaim the mainland leading to some desire for a nuclear program. When the P.R.C. tested its first nuclear weapon in 1964, Taiwan's desire for a nuclear weapon significantly increased. Taiwan felt that it could no longer be fully dependent on the US since it was not a major part of the US' defense or economy, and with China acquiring nuclear weapons Washington would not risk a conflict with China that could threaten American national security. The situation is reflected in this quote from PLA General Xiong Guangkai to a U.S. official: "You do not have the strategic leverage that you had in the 1950s when you threatened nuclear strikes on us. You were able to do that because we could not hit back. But if you hit us now, we can hit back. So, you will not make those threats. In the end you care more about Los Angeles than you do about Taipei" (Pasquale, 2007). With a greater threat from China and lowered confidence in the US, Taiwan began a covert nuclear weapons program. The operation was uncovered through the help of IAEA inspections and the

C.I.A. and its informants. The discovery of Taiwan’s nuclear weapons program led the U.S. to use its high leverage to take action and pressure the R.O.C. to end its nuclear program which shall be explored in more detail later.

*North Korea/ Democratic People’s Republic of Korea (DPRK)*

After the end of the Korean War in 1953, the U.S. continued to have a strong military presence in South Korea which threatened North Korea. To ensure its safety, North Korea signed treaties of mutual aid and cooperation with the USSR and China. However, confidence in the U.S.S.R. was shaken after the Cuban Missile Crisis, in which the Soviet removal of nuclear weapons from Cuba was viewed as a “betrayal” from the eyes of the DPRK (Person, 2012). The missiles were placed in Cuba as a deterrent from US aggression (History.com Editors, 2020). When the Kennedy Administration was able to get the U.S.S.R. to remove its missiles, this was seen as a signal that the U.S.S.R. would try its best to be on good terms with the U.S. instead of placing greater priority on protecting its allies (Person, 2012). North Korea lost its ally completely when the USSR dissolved in 1991. The DPRK slowly began to lose its strong ties and confidence with China as the two countries moved away from their shared ideology (Moore, 2008). It is worth noting that China still does play an important role to the DPRK, however, not as much as it used to. After losing confidence in its major allies, the perceived threat from the US and South Korea significantly increased and led to the development of a North Korean nuclear weapons program. North Korean efforts to develop nuclear weapons were successful due to the low amount of leverage the U.S. and China had over it which shall be explored in more detail later.

**Results**

Table with Country, Leverage Faced, and Respective Outcome

Country	Ally Leverage	Adversary Leverage	Outcome
North Korea	Low	Low	Success
Taiwan	High	High	Failure

After exploring the nuclear weapons programs of North Korea and Taiwan, it had been found that the levels of leverage placed over the respective country by its ally and adversary were different for the two countries. Taiwan had faced high ally and high adversary leverage, while North Korea faced low ally and adversary leverage. The fact that the two countries faced a different amount of leverage and had different results supports the hypothesis that leverage is a key variable affecting the outcome of a nuclear weapons program.

**Ally Leverage**

*Taiwan*

The United States, Taiwan’s main ally, had high leverage. This was because the US had a military treaty and high amounts of trade with Taiwan. In 1954, the U.S. and Taiwan signed a Mutual Defense Treaty that bound the U.S. to provide military support in case of a Chinese attack. As the U.S. increasingly saw Taiwan as a key ally against China, it had also deployed nuclear weapons on Taiwan to deter Chinese aggression. The Eisenhower administration was the first to place a dozen nuclear weapons on Taiwan and the number of nuclear weapons would peak to 200 under the Johnson administration (Norris et al., 1999). Since the U.S. provided military security that was needed to deter the main adversary of Taiwan, the U.S. had high leverage in terms of military assurances. The U.S. was also a key trade partner for Taiwan, this is inferred from the fact that U.S. imports accounted for an average of 23% of the ROC’s total imports in the ‘70s and ‘80s, this decade is examined since this was when Taiwan was developing its program (Martellaro, 1987). The security and economic dependence that Taiwan had on the U.S. became the main reason why

Taiwan was pressured to give up its nuclear program. After the U.S. suspicions of Taiwan developing nuclear weapons were confirmed by the CIA, the American government acted swiftly to issue a warning threatening to impose sanctions and end military assistance (Miller, 2014).

Since Taiwan was highly dependent on the U.S. economically, sanctions would have had major implications for its economy. The threat to remove U.S. security assurances also pressured Taipei to give up its nuclear program. The lack of military security would have created a dire situation for Taiwan. Without U.S. security, it would have had no ability to deter the Chinese invasion. The P.R.C. made clear that if it was known that the R.O.C. was developing nuclear weapons, it would use military action and even go so far as conquering Taiwan to prevent its proliferation (Albright & Stricker, 2018). Developing nuclear weapons would have incited the attack which they were meant to deter. As Secretary of State George Shultz explained, “Taiwan’s potential threat comes from the PRC, which has a substantial nuclear force and a variety of delivery systems and could not expect to match PRC capabilities under any foreseeable circumstance,” he also added that a nuclear strike on an island with the small geographical size and large population density of Taiwan would be devastating (Albright & Stricker, 2018). In 1956, a National Intelligence Estimate presented to US intelligence assessed that if Communist China became convinced that the U.S. “would not assist in defense of the [offshore] islands with its own forces, or react in strength elsewhere, they probably would attempt to seize them” (Central Intelligence Agency, 1956). The comparison of Taiwan and China’s military capabilities shall be explored in more detail later to explain why Chinese preemptive strikes were credible and why it would have succeeded in conquering Taiwan if the R.O.C. did not have US support.

As seen in the last few paragraphs, the US met the first requirement of high ally leverage which is to have high amounts of economic activity and a major military treaty with the country trying to acquire nuclear weapons. The US also meets the next requirement of high ally leverage by being able to sanction trade and remove its military treaty with Taiwan without having major negative implications for itself. The consequence of abandoning Taiwan militarily would mean that an ally against China and communism would have been lost, however, this would not have had any major negative implications on the national security of the US. The US would have also been able to place sanctions on Taiwan since the US had a strong economy and was not very dependent on Taiwan for trade; Taiwan accounted for less than 5% of total imports by the US during the 1970s and ’80s (Martellaro, 1987). Since the US had a military assurance, large amounts of trade, and the ability to place sanctions and take away its assurances to Taiwan, the U.S. had high ally leverage. This leverage was used to pressure Taiwan into giving up its nuclear weapons program.

## DPRK

The U.S. had high leverage and was able to use that leverage on Taiwan; however, the DPRK's major ally, China, had low leverage. Though China is a major source of trade and military assurance, it could not place sanctions or take away its military guarantee without significant negative impacts on its national security and economy.

China is the DPRK's main trade partner and trade between the two countries was \$1.5 billion in 2005, China also sent 500,000 tons of grain as aid that year (aid is a signifier of economic dependence) (Moore 2008). The two countries have also signed a Mutual Aid and Defense Agreement which binds China to provide aid and military support during times of conflict. From these facts it is evident that China has plenty of leverage over the DPRK in trade and security aspects, however, it did not want to use the leverage it had. The Chinese concerns presented in this paragraph and the next 2 paragraphs are paraphrased from research by Moore (2008). The lack of pressure placed on North Korea is not because China supports the nuclearization of the DPRK. In fact, China feared that the increasing nuclear capabilities of the DPRK could set off an arms race in East Asia with South Korea, Japan, and Taiwan seeking nuclear weapons that could tilt the balance of power away from China in the region. The threat of Japan going nuclear was a credible risk to China since Japan already had some politicians pushing for nuclear capabilities and had enough plutonium to produce many nuclear bombs. South Korea also had support for nuclear weapons domestically from politicians such as Lee Hoi-Chang in 2006. With an increased threat from the DPRK, support from politicians and the public would only get stronger. DPRK’s nuclear program could also cause a direct threat to China’s relationships

with North Korea. While it is unlikely that Kim Jong-un would use nuclear weapons against China, officials in Beijing do not rule out the possibility of coercion by the DPRK. This concern is not irrational since Pyongyang had tried to coerce Beijing in 1996. After China responded to a request by Kim Jong-Il asking for 200,000 tons of grain by stating that it could only provide 20,000 tons, Pyongyang threatened to form cultural and economic ties with Taiwan and made 6 other demands including the shipment of Chinese weapons. A similar exchange occurred in 1997 when China threatened to cut off food aid to North Korea and Pyongyang responded by threatening to form diplomatic ties with Taiwan by negotiating direct flights between the two countries. The DPRK and the ROC forming diplomatic relations would have indicated that North Korea recognized Taiwan as an independent country. This was not in China's interests since it wanted to eventually reclaim Taiwan and has always maintained that Taiwan is still under China's jurisdiction.

China had low leverage over North Korea since it could not take away its military assurance or place sanctions without having major negative implications. China worried that if it took away its military assurance from the DPRK, the U.S. and its allies might have a higher chance of launching a preemptive strike since they would not have to worry about fighting the Chinese troops that would come to support North Korea. China also opposed sanctions at the UN Security Council, since Pyongyang has warned that a preemptive strike or sanctions would be an act of war. When provoked, the DPRK is most likely to attack the ROK due to geographic proximity and the desire to reunite Korea. If North Korea were to attack South Korea, the U.S. would have to join the conflict since it is the ROK's ally. In a major conflict such as this, without Chinese support the DPRK has a high chance of losing and being taken over by the U.S.-South Korean forces, leading to a complete collapse of North Korea. Beijing would worry about the aid it would have to commit to ensuring peace in the now collapsed North Korean state. China would have to finance aid and resources to help rebuild, and possibly fund a peacekeeping force all of which would be a burden to the Chinese economy. Another concern is whether a united Korea would be an ally of China or the U.S. Allying with the U.S. would mean that a potential adversary shares a border with China and the buffer that historically protected China from South Korea and Japan would be gone, leading to a significant blow to China's national security.

Financially, China would suffer enormous losses if there was a military escalation in the Korean peninsula. China's top trading partners, the U.S., South Korea, and Japan, would be involved if there was a conflict in Korea. This would mean that over 34% of China's income from trade would be destabilized. Fighting in North Korea would also mean that the large amounts of foreign investment that is being committed to China will start to go towards safer regions such as Europe or the Americas. The slowing of the economy would lead to major unemployment in China, meaning that the poor and laid-off workers would start to create social unrest and possibly lead to new political movements that challenge the CCP (Chinese Communist Party). Another reason Beijing opposed sanctions and military action is that instability in North Korea as a result of economic sanctions or war would also mean that high amounts of refugees would pour into Northeast China. There are already about 60,000 to 100,000 Korean refugees living in the Yambian region of China, and a collapse of North Korea means that thousands more will flow in. Beijing fears that high concentrations of Koreans might lead to a movement of Korean nationalism and create domestic problems. North Korean refugees also have a reputation in China for being involved in criminal activities which could add another internal security threat. Unlike the U.S. which had high leverage over Taiwan, China had low leverage since it could not place sanctions or remove its military assurances without risking adverse effects for its own national security, economy, and other key interests. The difference between the leverage of the ally of the two countries is what caused the different outcomes for the two nuclear weapons programs.

## Adversary Leverage

### *Taiwan*

China had high adversary leverage over Taiwan since it threatened preemptive strikes and had the ability to launch said preemptive strikes. At the time Taiwan was trying to acquire nuclear weapons China did not have knowledge of the nuclear program, this was due to the confidentiality of the US in sharing its discovery of a covert weapons program with China. Beijing's knowledge of a Taiwanese nuclear program would have caused a significant increase in tensions

on the Taiwanese Strait, possibly leading to Chinese military intervention in Taiwan which would have been costly for all parties involved (China, Taiwan, and the US). Even without a direct role in the disarmament of Taiwan, the PRC. did play a significant role in the decision of Taipei to give up its nuclear ambitions. This was due to the threat that China would have posed to Taiwan if the U.S. acted on the removal of its military assistance to Taiwan which it threatened to do. A sudden end to US-Taiwan relations would have sent a signal to China that Taiwan had done something against the interests of the US. China knows that one of the few reasons why the US could have ended relations with Taiwan in such a sudden way is due to the US policy of ending all military and economic activity with a country developing nuclear weapons. This would have led China to become suspicious of a Taiwanese nuclear program. If China's suspicions were somehow proved through Chinese intelligence, preemptive strikes on Taiwan would have most likely followed since China had repeatedly warned that if it was known that the R.O.C. was developing nuclear weapons, it would use military action to prevent its proliferation. To reflect this situation a declassified State Department cable to the AIT(American Institute in Taiwan) in Taipei from April 1988, drafted by an official by the last name of Brown and signed by Secretary of State George Shultz explains that, "During the period in which even the first nuclear weapon with some form of the delivery system was being produced, Taiwan would expose itself to the threat of a conventional preemptive strike, such as that conducted by Israel against Iraq's nuclear facility in 1981"(Albright & Stricker, 2018). China's forces are much stronger compared to Taiwan. From 1976 to 1988 Taiwan had an average Composite Index of National Capability (CINC) score, a method of measuring military capabilities as developed by the Correlates of War Project, of 0.007, while China had a CINC of 0.117(David et al., 1816–2012). This specific range of years is selected since 1976 was when the US began to place pressure on Taiwan and continued to do so until 1988 when Taiwan shut down its last nuclear reactor. China's advantage is clear when comparing the militaries of the two countries in 1977 using an IISS (International Institute for Strategic Study) military balance assessment ("Asia and Australasia," 1977). The year 1977 is selected since that was when the US first threatened to cut off ties with Taiwan and gave a set of demands that ultimately ended Taiwan's nuclear program that had to be met to prevent the ending of US-Taiwan relations. When comparing the two countries, China's army personnel is about 10 times the size of Taiwan's. China's navy is also much larger when looking at the number of ships. China has 200 more combat aircraft compared to Taiwan. The size differences themselves give China the upper hand in a conflict with Taiwan. The most dangerous aspect of China's military capability is that in 1976 China had 180 nuclear warheads (Norris & Kristensen, 2010). This would have meant that China could completely wipe out Taiwan without the need of deploying a single soldier. The large military advantage that China had would allow it to launch a preemptive strike to destroy Taiwan's nuclear weapons program and satisfy the Chinese desire to reunify Taiwan with the mainland through an invasion. Since China could credibly threaten preemptive strikes, it had high adversary leverage. The threat of preemptive strikes created pressure on Taiwan to give up its nuclear ambitions and stay on good terms with the US.

## DPRK

North Korea's main adversary, the US, had low adversary leverage over the DPRK. Even though the US could reduce its military threat and provide incentives to North Korea, it could not establish credibility that it would keep its commitments. In addition to that, it could not credibly threaten preemptive strikes either.

The U.S. had leverage since it could reduce some of its military presence, the main reason after all for the DPRK developing nuclear weapons was to deter aggression from the U.S. and South Korea. The high number of American troops and Team Spirit, a military exercise between the U.S. and South Korean forces, which was viewed as a nuclear threat by North Korea since nuclear-capable forces took part, posed a dire security situation for North Korea. By reducing some of its military presence, the U.S. could have reduced the motivation of pursuing a nuclear capability. The U.S. did try to use this form of leverage however it was not able to create credibility by fulfilling its promises. When the U.S. removed its nuclear warheads from South Korea in 1991, the DPRK responded by signing two accords with South Korea, an Agreement on Reconciliation, Non-Aggression, and Exchanges and Cooperation, and a Joint Declaration on the Denuclearization of the Korean peninsula. When Team Spirit was paused in 1992, the

DPRK agreed to I.A.E.A. safeguards and inspections and halted reprocessing activities. However, the U.S. was not able to hold onto these promises, instead, soon after North Korea began to cooperate there was domestic and South Korean pressure to begin coercing Pyongyang. This was due to a shared image that North Korea could not be trusted to carry out its agreements and the idea that by giving rewards to stop the development of nuclear weapons, other countries would start to acquire nuclear weapons just to get rewarded. After cooperation, the U.S. made full compliance with the NPT a precondition for negotiations and threatened to use airstrikes if Pyongyang did not follow their demands. The threat from the U.S. was again increased when Team Spirit was resumed even after repeated warnings from the DPRK not to. This led to North Korea responding by leaving the NPT and resuming the development of nuclear weapons. The threat to use airstrikes did not make sense in this situation since the U.S. just reduced its military threat and got North Korea to cooperate but again decided to increase its military threat toward the DPRK by threatening to use airstrikes (The information presented in the paragraph is paraphrased from (Sigal, 1999). This lowered the credibility of the US, thus giving the US low adversary leverage.

In addition to military assurances, the DPRK also wanted to use its nuclear program as a bargaining chip to secure economic and diplomatic normalization with the U.S. as well as other incentives. Economic relations with the US would have been a major asset to the North Korean economy. The DPRK also expressed interest in getting a nuclear reactor (under IAEA safeguards) from the U.S. to improve energy production. North Korea tried to gain these incentives through the negotiations it had with the US, especially the Agreed Framework of 1994, which was an agreement on a set of steps that had to be taken by both sides to reach nuclear disarmament. Since the two sides had to rely on each other to reach their respective end goals, the agreement was considered credible (at the time) by the two countries. The agreement basically gave the DPRK a reduced American military threat, normalization of U.S. relations, and a nuclear reactor for peaceful energy-generating purposes in exchange for North Korea agreeing to IAEA inspections, stopping the construction of two new reactors, and eventually dismantling their nuclear warheads (Ha & Hwang, 2015). The Agreed Framework froze the nuclear program until 2002, after which the framework ultimately failed since the U.S. could not fulfill its promises.

The Agreed Framework faced a couple of difficulties in being implemented as explained by Ha and Hwang (2015). The Agreed Framework faced domestic opposition in the U.S. when the Republican Party took control of Congress in the midterm elections of 1994. The Republicans saw the framework as appeasement by the U.S. and criticized Clinton for agreeing to a framework that was blackmail by the DPRK. As a result, the \$1 billion in funding that was required by the Agreed Framework faced significant delays and resistance in Congress. The money was needed to help fund KEDO (Korean Energy Development Agency) which was an organization to help fund the reactor provided by the Agreed Framework involving the U.S., South Korea, and Japan. Without the necessary funding, there were repeated delays in implementation of the agreement from which the DPRK assumed that the U.S. was not credible since it did not stick to its commitments under the Agreed Framework. North Korea and the US ended up abandoning the agreement in 2002. Without establishing credibility, the US had low leverage, as a result, North Korea was able to test its first nuclear weapon on October 9th, 2006. While efforts to get North Korea to give up its nuclear warheads continue until today this paper will not cover those events since there has been no significant progress since 2006 and the DPRK has been continuing to grow its nuclear capabilities.

Aside from security assurances and normalization, the U.S. also tried to create other forms of leverage by threatening preemptive strikes. However, Sigal (1999) explains that the threat of military action such as preemptive strikes was not credible for several reasons. He explains that since the American intelligence had no idea where the nuclear materials such as plutonium were stored. Even if the strikes were successful there was a risk that radiation would drift towards Japan and create health hazards. He continues to explain that the only option left is to disarm the D.P.R.K. through military action was to invade the country and destroy the nuclear facilities like what the U.S. did to Iraq. However due to the high death toll both the U.S. and South Korea did not want to take that path. War with North Korea would have caused 1 million military and civilian casualties including 80,000 to 100,000 American lives; the financial burden of war with the D.P.R.K. would have been \$100 billion. He states that another reason why South Korea and Japan did not want to use military action is due to concerns of large waves of refugees that they would have



to provide for if war broke out. Without being able to gain credibility in its promises to reduce its military threat toward the DPRK and not having credible threats for preemptive strikes the U.S. had low adversary leverage over North Korea and as a result failed in its non-proliferation efforts.

## Discussion

Allies play a key role in a country's security and economic health through the signing of defense treaties and trade, and in the case of the development of nuclear weapons provide a defense against preemptive attack and allow a country to develop nuclear weapons as Monteiro and Debs explain. Major power countries as allies are especially valuable due to the defensive benefits the weaker country will acquire. If the weaker country is attacked, the aggressor will have to face the powerful military of the ally. This helps the weaker country gain a key source of deterrence against adversary attacks and a source of support during times of conflict. Without allies, a country would not have reliable trading partners which would hurt its economy; a country without allies would have to rely on itself in times of conflict which could be a major problem when facing a significantly more powerful adversary. It is also worth noting that without a strong ally a weak country is open to preemptive strikes by an adversary when trying to develop nuclear weapons. Due to the benefits that allies provide to a country, they hold a significant amount of leverage over a country. To prevent the spread of nuclear weapons, the major ally to the CANW must be able to use the leverage it has to stop the development of nuclear weapons.

Adversaries can also hold a significant amount of leverage over a CANW since many states pursue a nuclear capability due to the threat posed by the adversary. If the adversary pledges to end a threatening military policy or strategy, the CANW no longer has as strong of an incentive to develop a nuclear weapon. This approach requires the adversary to have credibility and to gain trust with the CANW which can be accomplished by fulfilling its promises to reduce its military threat or any other promises it makes during the negotiations. The adversary also holds leverage over the CANW if it can afford to launch a preemptive strike to destroy the progress made by the nuclear program and have devastating impacts on the CANW in terms of lives and destruction. By using the leverage, it has, the major adversary of a country trying to develop nuclear weapons is a key factor to stop a country's nuclear weapons program.

The use of leverage by the ally and adversary plays a key role in determining the outcome of a nuclear weapons program. It is imperative for future non-proliferation efforts to ensure that maximum leverage is placed on the CANW to ensure that nuclear weapons and the threat they pose do not spread.

## Conclusion and Implications

From the comparison of the North Korean and Taiwanese nuclear weapons programs, it is determined that ally and adversary leverage is a key variable affecting the outcome of a nuclear weapons program. From this, it can be learned that both the adversary and ally of a country trying to develop nuclear weapons must use the leverage they have to pressure that country to give up its nuclear ambitions.

This lesson can be applied to the concerns today as explained by Heginbotham and Samuels (2020) that South Korea might acquire nuclear weapons in the future to combat China's rising power, the increasing nuclear capabilities of North Korea, and the instability of the US security assurances. If the situation arises where the ROK decides to start developing nuclear weapons, the country's main ally and adversary must apply the leverage they have if they hope to halt the program. The ally, in this case, the US, had high leverage over the ROK since it is a major source of trade and has a military assurance that provides a key source of deterrence against the adversary, China. The US is also a major source of trade, ranking as the 2nd largest trading partner with bilateral trade amounting to 134 billion USD in 2019 (Santander, 2021; Office of the United States Trade Representative, n.d.). By threatening sanctions, the US could create some pressure on South Korea to give up its nuclear weapons program. However, since the economy of the ROK. is quite strong and not extremely dependent on the US, sanctions would not be enough to outweigh the national

security concerns of South Korea. Instead, the most effective form of leverage by the US would be through threatening to remove security assurances. Currently, the US covers South Korea under its nuclear umbrella, a guarantee by the US to use its nuclear weapons in case of an attack, the US also stations 28,500 troops in South Korea (Robert Burns and Matthew Lee, The Associated Press, 2021; Kulacki, 2021). The US security assurances provide South Korea with security against potential North Korean aggression. In a situation where the ROK decides to develop nuclear weapons, the US should threaten to completely remove its security guarantees, creating the risk of a preemptive strike. Along with the use of leverage by the major ally, the major adversary (North Korea in this case) should also try to use the leverage it has to prevent a nuclear South Korea. North Korea could prevent a South Korean nuclear capability by threatening to or actually launch a preemptive strike or invade South Korea. This is a credible threat since North Korean artillery can easily reach Seoul without warning. North Korea having nuclear weapons capability also adds to the threat faced by the ROK without American protection. China would also join the North Korean forces since a nuclear-armed South Korea poses a security threat to it too. Such a major conflict would inflict huge damage to South Korea. Another way that North Korea could use leverage is by pledging (and carrying out that pledge) to slow its nuclear weapons program. The DPRK has an incentive to do so since a South Korean nuclear weapons program would create a major security threat for North Korea. With a lower threat from North Korea, South Korea would also lose its interest to develop nuclear weapons, especially if it means it can avoid sanctions and military abandonment by the US.

## Future Research

Future studies should attempt to apply my theory of leverage to other countries to see if it can apply beyond the scope of the North Korean and Taiwanese nuclear program. Future studies should also investigate if there are other variables that might have had a significant effect on the outcome of a nuclear weapons program.

## Limitations

My study and the hypothesis presented only applies to countries that have faced or will face pressure to give up their nuclear weapons program. That being said, it is important to note that the study does not apply to the first 5 nuclear powers (US, USSR, China, UK, and France) who faced little or no pressure to give up their nuclear ambition. My study assumes that all countries that try to acquire nuclear weapons have an ally and adversary as coded in my methods section, this may not be the case for all countries. The study also assumes that the ally and adversary of the country attempting to acquire nuclear weapons do not wish that country to do so. Another limitation of my study is that it focused only on the response of the ally and adversary of the country trying to acquire nuclear weapons. Since my study only focused on one variable, a possible limitation is that there could be other variables responsible for the different outcomes of the two countries' nuclear weapons programs.

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